First Annual Report to NOAA Office of Global Programs

Project title:

"Improvement of Forecast Communication and Use between Indigenous and Governmental Groups in Australia: Managing Fire in Arid and Semi-Arid Lands under Conditions of Interannual Climate Variability"

Principal Investigator:
Ben Orlove
Professor, Department of Environmental Science and Policy, UC Davis, and
Adjunct Senior Research Scientist,
International Research Institute for Climate Prediction
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Readjustment of work to concentrate initially on two field sites

Two major factors have led the PI to decide to focus on two, rather than three, field sites. Though the initial plan was to compare communication and use of forecasts between different groups in three sites in generally similar sites across northern Australia, shifting economic conditions and a growing awareness of logistical issues made it seem more effective to concentrate on two. Firstly, the US dollar fell sharply in relation to the Australian dollar. The US dollar stood at AU$1.85 when the letter of intent was sent (correspondingly, the Australian dollar was worth US$0.54 at the time). At present, the US dollars buys only AU$1.33, and the Australian dollar has risen to US$0.75, a little down from its high of US$0.80. The US dollar buys only 72% of what it could two years ago. Since roughly 60% of the direct expenses are destined to be spent in Australia, this is a significant decline. Secondly, the PI realized that it would take a significant amount of time to build the ties in the field sites so that reliable data could be collected effectively. Granted the large distances in Australia and the fact that each of the three sites required groundwork to build working relations with key individuals, it seemed more effective to concentrate funding and time on the two first two sites, where initial links proved most promising. The third site, Kununurra, is an interesting one and the potential of a third comparison remains promising; nonetheless, the shortfall of purchasing power of the funds and the difficulties of adding a third site led the PI to table that site, for the time being at least. These decisions were made after extensive consultation with the sub-contractor, Nigel Tapper, Professor of Geography and Environmental Science, Monash University, Melbourne and with scientists at the Tropical Savannah Cooperative Research Centre in Darwin.

Accomplishments to date

Laying the groundwork: The PI made an initial visit to Australia in August 2003. A number of meetings took place with the sub-contractor, Nigel Tapper, and with researchers at the Tropical Savannah Cooperative Research Centre in Darwin. In

addition, the PI met with a number of staff at the Bureau of Meteorology, including forecasters and application specialists. A short visit to the first field site, Lakefield National Park in the Laura River basin in Queensland, permitted the development of initial contacts with individuals in bushfire management agencies, and gave a sense of the relations of the park authorities with local land managers. The sub-contractor made a second visit to this area, after the PI returned to the US, and met with Aboriginal and European-Australian staff of Balkanu Aboriginal Corporation, a key group involved in land management and indigenous knowledge in the region. A somewhat longer trip to the second field site, Maningrida in Arnhem Land in the Northern Territory, provided the PI with a deeper view of Aboriginal knowledge and land management in the region. It allowed as well the development of more extensive ties with key European-Australian and Aboriginal staff in Bawinanga Aboriginal Corporation, a similar group involved in land management and indigenous knowledge in that region. A visit to Kakadu National Park in the Northern Territory also supported the understanding of these regions, since, like Lakefield, it is administered as a national park and since, like Maningrida (on which it borders) it has significant levels of Aboriginal involvement in land management. In addition, the PI had substantive conversations with other anthropologists and ecologists to develop a fuller sense of interactions between Aboriginal groups and government agency staff in matters of environmental management.

Partners: Though the PI had had extensive interactions with the sub-contractor during the latter's visits to the IRI and to the University of California, these ties were strengthened during field visits and time spent at Australian universities and agencies. The links with the Tropical Savannah Cooperative Research Centre developed from initial email inquiries to more extensive personal relations, particular with a key individual, Jeremy Russell-Smith, who is involved both with the TS-CRC and with the Bushfire Council, the key bushfire agency in the Northern Territory, and who has considerable experience in Queensland as well.

Initial fieldwork: Visits to the field have permitted a more precise delimitation of the research sites. For the Queensland site, we will work within the boundaries of Lakefield National Park, and include the bordering pastoral estates, whose limits are mapped. For the Northern Territory site, we will work in the social catchment of Maningrida, including the "outstations" or remote settlements served by Bawinanga Aboriginal Corporation; their location is also marked on maps that we have obtained.

On the basis of extensive consultation with the sub-contractor and other associates, the PI set some parameters for two key field activities.

The first is the fire logs, the records that local Aboriginal residents will keep of bushfires in their region. Though the final details have not been worked out, certain aspects are coming closer to definition. These logs will be kept for each observed fire, rather than for each day during the fire season, to avoid major logistical difficulties in record-keeping and to acknowledge that fires are relatively infrequent. The log-keeping unit will be a small social group (a family or a small cluster of families) rather than an individual, since these are the locally culturally-recognized groups that have responsibility to monitor

fires. There will be some questions on the logs that will be replicated between sites, but the communities in each site may add some additional questions of importance to them. This plan supports local involvement and engagement with the project, and also can serve to direct attention to site-specific characteristics.

The second is the collection of remote-sensing data. This portion of the project will be conducted largely at Monash University. We will use the high-resolution MODIS images to observe fires. We are particularly interested in examining the temporal and spatial distribution of fires. We will draw on weather data from stations in nearby locations to assess the particular seasons, according to the traditional Aboriginal calendars. We will look to see the patterning of burning by Aboriginal seasons, and we will analyze the effects of proximity to outstations and to roads on burning. This work represents a significant advance on the use of remote sensing to observe bushfires in areas under both Aboriginal and state management, since such work to date has used less frequent or less accurate sensing techniques.

Preliminary insights/results

The initial field work has generated some preliminary insights.

Though this project is conceived as a study of the use of forecasts in the context of interannual climate variability; the management of bushfires happened to be the application of the forecasts under view. From the perspective of virtually all participants in northern Australia, though, the background and foreground are reversed; this project, in their view, is a bushfire project that happens to include a climate component. There are at least four reasons for this. Firstly, bushfires are a major concern across Australia, and they are important in areas of lesser climate variability as well as in areas of greater climate variability. Secondly, bushfire policy is changing in Australia, so many people focus on a number of aspects of bushfires. Thirdly, bushfire management has attracted attention recently as one important aspect of Aboriginal land management, so that it is a theme in the debates over Aboriginal land claims and land rights. Finally, some actors conceive of the sort of climate information that they use as monitoring rather than forecasting (and in fact the line between the two is difficult to trace).

The large spatial scales of northern Australia and the low population densities have encouraged the extensive use of remote sensing. Though members of the team had been familiar with the use of remote sensing by government agencies, and had some sense that it had been adopted by a number of managers of pastoral estates, it is surprising to see the burgeoning interest on the part of Aboriginal organizations and individuals. One of the strong requests from Aboriginal groups was for training in the analysis of remote sensing data and GIS.

These spatial scales also raise difficulties for many Aboriginal Australians to burn savannah woodlands as frequently as they would wish, and, it seems, as closely to their preferred calendars as they would wish. Many of them use cars and trucks (lorries) to travel across their country, and do not have as regular access to vehicles in good repair as

they would like; gasoline (petrol) is also an expense. These spatial scales also lead those European-Australians who can afford it to use aerial means of starting fires, throwing fire propagules from airplanes or helicopters. Aborigines express different views about these aerial fire starts, some finding them as disrespectful of spirits on the land and others considering them a promising technique. (To offer only one of many examples of the extraordinary cultural juxtapositions that this project raises, one Aborigine gave me a description of a helicopter flight in which large clouds suddenly appeared and drew close; the Aborigine knew how to sing to the clouds to make them disperse.)

Regarding the three obstacles to communication discussed in the proposal, some very preliminary points may be drawn.

For linguistic factors, some differences between the two sites may be seen. The level of use of Kriol (a creole language derived from English with an admixture of Aboriginal words and forms, and elements from Portuguese and Malay as well) is high in both sites. However, the proportion of the Aboriginal population fluent in Aboriginal languages is a bit lower in the Queensland site; in the Northern Territory site, by contrast, most Aborigines speak two or three Aboriginal languages fluently. (Since marriage between language groups is common, many children grow up speaking more than one Aboriginal language.) We note as well a strong association of language and territory. In the Aboriginal perspective, the language is a property of a territory (and the spirits that reside there) as well as of a social group, usually a set of clans.

For conceptual factors, we note a sharp difference in cultural attitudes towards fire between Aborigines and European-Australians. The latter often use the words “casual” and “relaxed” to describe the view of the former, and indeed Aborigines often seem unconcerned about the presence of low flames spreading slowly through leaf litter and undergrowth. (The PI, raised in the US, was astonished to see such ‘cool’ fires treated so calmly.) There may be several roots to this attitude, such as long experience that points to few disastrous fires, a sense of wind and fuel conditions that allow an assessment of the likelihood that the fire will become hotter and stronger. We also note a lack of fit between culturally constructed calendars. European-Australian land managers talk of two seasons, the “wet” and the “dry”. (They note as well the hot humid period before the start of the wet, and term it the “build-up.” In their cultural system, this “build-up” is a part of the dry season.) At times, they divide the dry into two halves of equal duration, with the build-up occurring in the late dry. Aboriginal systems vary, but usually include a larger number of seasons. In one case in the Northern Territory, there are three seasons within what the European-Australians term the dry; the shift between the two is determined by meteorological factors that can vary from year to year, so that the overlap of the two systems can differ.

The organizational factors, at least in our initial view, are the most important. Most simply, many Aborigines would like to schedule the use of motor vehicles belonging to government agencies to conduct burns, but the procedures for requesting and obtaining vehicles are complicated. Secondly, some government agencies and pastoral estates conduct at least three sorts of burns—careful controlled burns near residences and

administrative offices to reduce the risk of damage to structures; perimeter burns to prevent fires from spreading from neighboring parcels; interior burns to reduce the spread of large fires within parcels. At a more basic level, there is an interesting use of knowledge as a basis for claiming legitimate rights to make decisions about the timing and location of burns; Aborigines often voice the view that their long history of unbroken connection with landscapes and their close familiarity with these landscapes support the appropriateness of their decisions, while European-Australian land managers place reliance on scientific training and instrumentation. At times, some express an interest in the other's knowledge, but at others, they disparage this knowledge, or challenge the other's claims to represent true Aboriginal culture or true modern science.

Preliminary plans for year two

For our second year, we plan to collect fire logs in the two field sites, working closely with the respective Aboriginal Corporations. Students at Monash University will process MODIS imagery and coordinate the mapping of settlements, roads, and vegetation types for the remote sensing. We will coordinate meetings between Aboriginal residents and government agency managers in each of the two sites. We plan to begin with a discussion of the different and non-overlapping seasonal calendars, a topic that seems relatively neutral. As this progresses and trust builds, we may move towards addressing the question of the placing of value on different knowledge systems as claims to legitimize rights to burn landscape, a more sensitive topic, though that may proceed differently in the distinct settings of the two field sites.